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MYODELTHYRIUM, A NEW PERMIAN GENUS OF THE SYRINGOTHYRIDACEA FREDERIKS 1926 (BRACHIOPODA)

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ABSTRACT: *Myodelthyrium* is proposed as a new generic name for a syringothyridacean species originally placed in *Pseudosyringothyris* Frederiks 1916. The type species is *M. dickinsi* (Thomas 1971). Its distinguishing structures include a pair of muscle scars on the inside of the delthyrial plate.

The distinctive West Australian Permian species *Pseudosyringothyris dickinsi* was described by Thomas (1971). The species was earlier reported in an unpublished Ph.D. thesis of the University of Melbourne by Thomas in 1961. This species is a prominent constituent of the Early Permian (Sterlitamakian) faunas of the Callytharra Formation of the Carnarvon Basin. It is also known from the Canning Basin and is a useful index fossil for interbasinal correlation.

The species is clearly a member of the spiriferid superfamily Syringothyridacea Frederiks 1926, as interpreted by Ivanova (1972), characterised by punctate (mostly) spiriferids with high ventral interareas, simple lateral costae, generally smooth ventral sinuses and smooth or medially-grooved fastigia. *Syringothyris* Winchell 1863 and *Pseudosyrinx* Weller 1914 are representative of the 20 or so genera now included in the superfamily. Many are large forms.

Thomas (1971) ascribed *P. dickinsi* to *Pseudosyringothyris* Frederiks 1916, provisionally accepting the interpretation of Gobbett (1964, p. 174) that his punctate species *P. borealis* Gobbett as well as an unnamed species from the Permian (Svalbardian) Spirifer Limestone of Spitzbergen belonged in *Pseudosyringothyris*. The Spitzbergen species possess a median longitudinal ridge on the inside of the delthyrial plate, with depressions on each side.

Frederiks (1916) erected *Pseudosyringothyris* as a subgenus of *Cyrtia*, type species *Cyrtia* (*Pseudosyringothyris*) *karpinskii* Frederiks 1916. His English summary reads: "Shell large, transverse; hinge line straight, usually as long as the greatest breadth of the shell; area high flat; sinus deep and wide; surface ornamented by many radial ribs. Internally between the dental plates in the delthyrium is a transverse delthyrial plate, which has on the interior side a roller-like callosity, called a pseudosyrings" (sic). The pseudosyrinx was considered by Frederiks (1916, p. 49) to represent a stage in the evolution of the syrinx. The roller-like callosity was illustrated in a section (Frederiks 1916, fig. 16 and plate 3, fig. 9a), reproduced in Thomas (1971, fig. 47). This structure is a shell thickening of the inner delthyrial plate with a median depression. Thomas (1971, p. 127, p. 138) regarded it as an adventitious secondary thickening similar to that shown in some specimens of *P. dickinsi* (Thomas 1971, fig. 55g). However, one of Frederiks' illustrations (Frederiks 1916, pl. 3, fig. 1d) seems to show a longitudinal median ridge on the inner delthyrial plate.

Pseudosyringothyris karpinskii was based on a small collection (1-2 specimens apparently) distinguished from the more numerous examples of *Cyrtia kulikiana* Frederiks 1916. All were collected from the Bolshezemelskaya Tundra of the northern Urals, U.S.S.R. The types of *P. karpinskii* and some of the specimens of *C. kulikiana* came from the Adzva River area. Frederiks noted the close resemblance of the two species but distinguised *P. karpinskii* on its pseudosyrinx, the outline of the umbo and the finer, sometimes dichotomous, ribs.

Pseudosyringothyris has been recognised in the Permian of the USSR by some Russian authors. Ivanova (1960) listed it with a brief diagnosis but without illustration as comprising only the type species, from the Bolshezemelskaya Tundra and from Novaya Zemlya. Solomina (1970) described a new species *P. inopinatus* from Northern Verkhoyan without illustrating or describing the internal delthyrial features. Zavodovskii (1970) described three species from north-eastern USSR: *P. inopinatus* and two new species *P.*(?) *russiensis* and *P. parenensis*. The inner delthyrial structures were not described or illustrated. Kalashnikov *in* Kalashnikov and Ustritskii (1981) provisionally included a new species *P.*(?) *ustritskyi* which appears to lack a delthyrial plate.

Grigoryeva (1977), in a comprehensive review of the licharewiids of Siberia and the Arctic, was critical of the use of *Pseudosyringothyris* by Gobbett (1964) and by Thomas (1971). She stated that the validity of *Pseudosyringothyris* is uncertain because *P. karpinskii* is said to be indistinguishable from *C. kulikiana* (Frederiks), the type species of *Cyrtella* Frederiks 1924. Extensive collecting by Ifanova (1972) from the topotype areas of both species has failed to provide any more examples of Frederiks' "pseudosyrinx" structures. *Cyrtella kulikiana* Frederiks is reported by Grigoryeva (1977) and by Grigoryeva and Kotlyar (1966) to possess a false or pseudodelthyrial plate, formed by internal secondary thickening in the delthyrial region.

From my enquiries in Leningrad in 1968, Frederiks' type specimens appear to be no longer available. In consequence, because of the uncertainties of the validity

of *Pseudosyringothyris* and of its internal delthyrial features, a new genus *Myodelthyrium* is proposed, type species *P. dickinsi* Thomas. Its principal distinguishing feature is the presence of a pair of strong oval muscle scars on the inside of the delthyrial plate, separated by a median longitudinal ridge.

SYSTEMATIC PALAEONTOLOGY

Order SPIRIFERIDA Waagen 1883
Suborder SPIRIFERIDINA Waagen 1883
Superfamily SYRINGOTHYRIDACEA Frederiks 1926
(*sensu* Ivanova 1972)
Family LICHAREWIIDAE Slyusareva 1958
(*sensu* Grigoryeva 1977)

Genus **Myodelthyrium** gen. nov.

TYPE SPECIES: *Pseudosyringothyris dickinsi* Thomas 1971.

ETYMOLOGY: mys, myos, a muscle; delos, visible; delthyrion, a door. Greek, masculine.

DIAGNOSIS: Large finely punctate syringothyridaceans resembling *Pseudosyrinx* Weller externally, high ventral interarea with perideltidium, smooth sinus and fastigium; numerous simple lateral costae. Internally with considerable apical callosity, short divergent adminicula and longer dental flanges both with thin initial components; well developed delthyrial plate with a pair of elongate oval muscle scars on the inside, separated by a median longitudinal ridge; dorsal cardinalia massive with recurved socket plates and strong crural plates; micro-ornament of fine short radial striae interspersed with oval to pear-shaped pustules.

SPECIMENS OF THE TYPE SPECIES: The holotype CPC 1636 and other illustrated specimens CPC 1634, 1635, 1637-1644 are in the Commonwealth Palaeontological Collection, Bureau of Mineral Resources, Geology and Geophysics, Canberra, A.C.T.

REMARKS: The diagnosis and description of the type species include the above features and are sufficiently

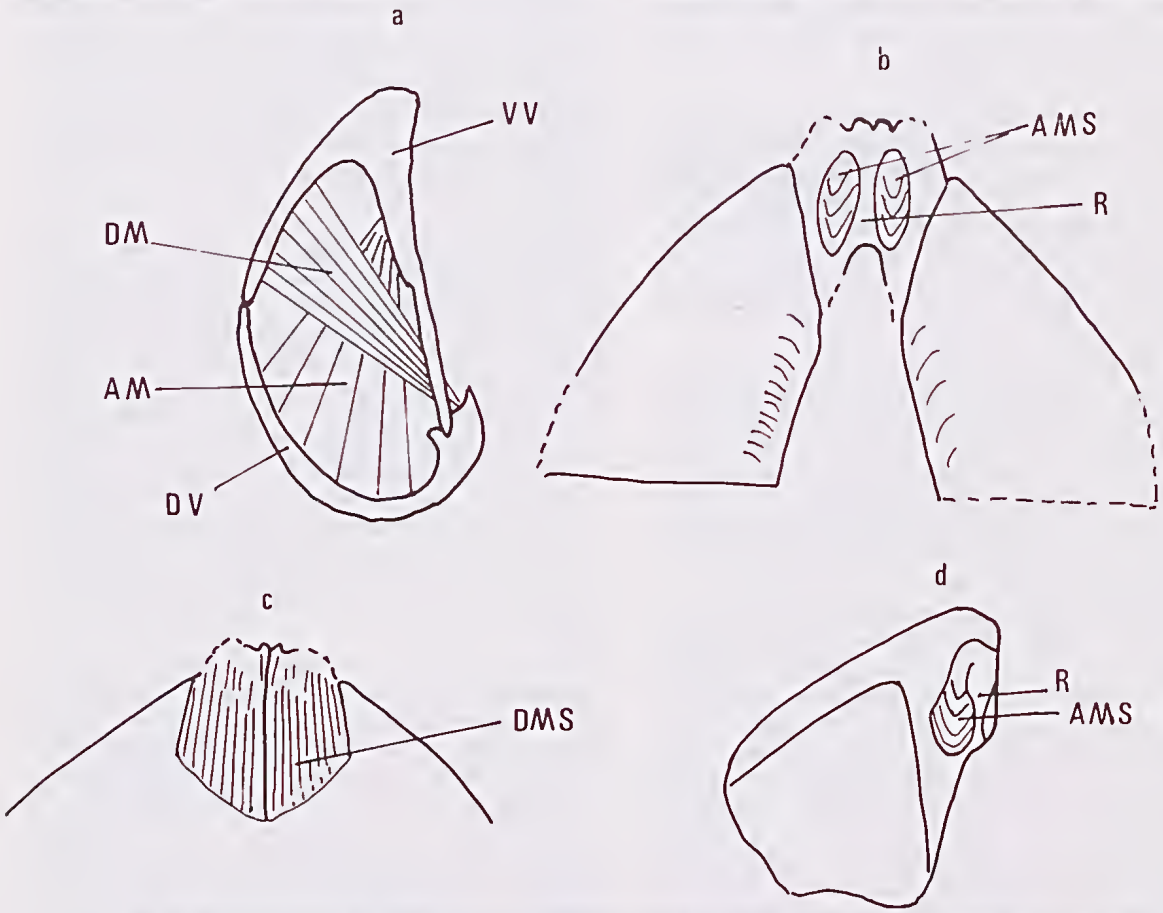

Fig. 1—*Myodelthyrium dickinsi* (Thomas) (modified from Thomas 1971, fig. 54). (a) Semidiagrammatic sketch of shell (×0.75), longitudinal profile section showing inferred muscle system; VV ventral valve, DV dorsal valve, AM adductor muscles, DM diductor muscles. (b) dorsal view of internal mould CPC 1639 (×1), showing adductor muscle scars AMS and median ridge R on inside of delthyrial plate. (c) ventral view of same mould (×0.9) showing diductor muscle scars DMS. (d) dorsal (internal) view of incomplete ventral valve CPC 1644 (×0.9) showing adductor muscle scar AMS and median ridge R. Specimens CPC 1639 and CPC 1644 are also illustrated in Thomas (1971, pl. 12, fig. 3a, b and pl. 10, fig. 5 respectively).

covered in Thomas (1971, p. 140-148). Later, more extensive, collections have been made from the Callytharra Formation by the author. They confirm the presence of a large species with high flat to gently incurved interareas up to 6.5 cm high and over 11 cm wide. On the inside of the large delthyrial plate is a pair of oval striated musele scars separated by a median longitudinal ridge (Fig. 1b, d). The delthyrial plate has a thin outer transverse initial component supported internally by shell thickening (Thomas, 1971, p. 146 and figs. 55, 56). It can be regarded as a "true" delthyrial plate in contrast to the "false" or pseudodelthyrial plate described by Grigoryeva and Kotlyar (1966) and Grigoryeva (1977) formed by apical shell thickening only. A stegidium is present in front of the delthyrial plate in one specimen, the holotype, Thomas (1971, p. 11, fig. 1e).

Thomas (1971, p. 146 and text fig. 54) presented arguments that the musele scars on the delthyrial plate are the site of attachment of the ventral adductor muscles. Fig. 1a shows a reconstruction of the musele system after Thomas (1971, text fig. 54). The ventral valve internal mould in Fig. 1b, e shows little indication of adductor musele scars in the median position except possibly in the posterior part between the longitudinally-striated diductor muscles. Other specimens show that the adductor muscle scars can be situated more posteriorly on the delthyrial plate and hence closer to the diductor scars. The position would be dependent on the slope of the interarea.

Comparable oval depressions separated by a median ridge are present on the inside of the delthyrial plate in *P. borealis* Gobbett (1964, plate 24, fig. 3). I have examined some of Gobbett's specimens (but not the holotype) in the Riksmuseum, Stockholm and confirm the presence of these depressions but striations were not noted. *Pseudosyringothyris borealis* therefore possibly belongs in *Myodelthyrium*. Further comparison with Gobbett's type specimens is desirable for confirmation.

Similar delthyrial structures have not otherwise been recorded but it is possible that they are present in other syringothyridacean species with high interareas suitably inclined to the dorsal valve. The internal delthyrial features of many species have not been recorded.

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